

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) An interconnection for interconnecting microelectronic chips with optical wires, wherein said optical wires are bonded onto said microelectronic chips and optically connected therewith.
2. (Original) The interconnection according to Claim 1, comprising a segment of an optical fiber, said segment having two opposite ends, said ends being a first end and a second end, said ends being attached to said microelectronic chips by means of terminations, said terminations being disposed on a substrate material having a first side and a second side.
3. (Original) The interconnection according to Claim 2, said terminations being optically coupled to said optical fiber and said terminations being further electrically coupled to said microelectronic chips.
4. (Original) The interconnection according to Claim 2, wherein said terminations comprise a laser chiplet and a photodetector chiplet, said first end being connected to said laser chiplet and said second end being connected to said photodetector chiplet.
5. (Original) The interconnection according to Claim 2, wherein said optical fiber is having a numerical aperture of at least about 0.35.
6. (Original) The interconnection according to Claim 2, further comprising a groove and a mirror.
7. (Original) The interconnection according to Claim 2, wherein said optical fiber is disposed within

a groove.

8. (Original) The interconnection according to Claim 3, wherein said terminations are vertically coupled devices.

9. (Original) The interconnection according to Claim 3, wherein said terminations further comprise solder bumps and gold/gold compression bonds.

10. (Original) The interconnection according to Claim 4, wherein an optical path is established so that light travels from said laser chiplet through said substrate material to said photodetector chiplet.

11. (Original) The interconnection according to Claim 4, wherein said terminations are having a size of not more than about 250 micrometers in width and not more than about 250 micrometers in length.

12. (Original) The interconnection according to Claim 4, wherein said laser chiplet comprises a vertical-cavity surface emitting laser.

13. (Original) The interconnection according to Claim 4, wherein said photodetector chiplet comprises a PIN photodiode detector or a metal-silicon-metal photodetector.

14. (Original) The interconnection according to Claim 6, wherein said mirror is disposed on said second side of said terminations.

15. (Original) The interconnection according to Claim 6, wherein said second side of said substrate is a (100) crystallographic surface, said groove is aligned along (011) crystallographic direction and

said mirror is aligned along (011) crystallographic direction.

16. (Original) The interconnection according to Claim 7, wherein said groove is V-shaped.

17. (Original) The interconnection according to Claim 9, wherein said electrical coupling of said terminations to said microelectronic chips is achieved with two or more of said solder bumps or said compression bonds.

18. (Original) The interconnection according to Claim 10, wherein said substrate material comprises gallium arsenide or indium phosphide.

19. (Original) The interconnection according to Claim 10, wherein said substrate material has a Zinc-blende crystallographic structure.

20. (Original) The interconnection according to Claim 12, wherein said vertical-cavity surface emitting laser is fabricated on a gallium arsenide substrate.

21. (Original) The interconnection according to Claim 12, wherein said vertical-cavity surface emitting laser is fabricated on a indium phosphide substrate.

22. (Original) The interconnection according to Claim 12, wherein said vertical-cavity surface emitting laser is disposed on said first side of said terminations.

23. (Original) The interconnection according to Claim 13, wherein said photodetector chiplets are disposed on said first side of said terminations.

24. (Original) The interconnection according to Claim 13, wherein said photodetector chiplets are

fabricated on a substrate material, said substrate material comprising gallium arsenide or indium phosphide.

25. (Original) The interconnection according to Claim 16, wherein said groove is disposed on said second side of said termination.

26. (Original) The interconnection according to Claim 20, wherein said vertical-cavity surface emitting laser emits at a wavelength selected from a group of wavelengths, said group comprising wavelengths of about 980 nanometers or about 1300 nanometers.

27. (Original) The interconnection according to Claim 21, wherein said vertical-cavity surface emitting laser emits at a wavelength selected from a group of wavelengths, said group comprising wavelengths of about 1300 nanometers or about 1550 nanometers.

28. (Original) The interconnection according to Claim 24, wherein said photodetector chiplets are sensitive within a range of wavelengths between about 980 nanometers and about 1550 nanometers.

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Canceled)

38. (Canceled)

39. (Canceled)

40. (Canceled)

41. (Canceled)

42. (New) An optical interconnection for connecting an optical fiber to an integrated circuits by an optical fiber, the integrated circuit including an integrated circuit substrate and a chiplet mounted on the integrated circuit substrate for connection to said optical fiber, the chiplet having:

- (a) a chiplet substrate with a termination device arranged on one side of the chiplet;
- (b) the optical fiber being disposed on another side of the chiplet substrate, the another side of the chiplet including an inclined surface for reflecting light through the chiplet and from the terminal device to the optical fiber or from the optical fiber to the terminal device.